REMARKS

Favorable reconsideration of the application is respectfully requested in light of the amendments and remarks herein.

Upon entry of this amendment, claims 1-10 will be pending. By this amendment, claims 1 and 6 have been amended. No new matter has been added.

§103 Rejection of Claims 1-10

On page 3 of the Office Action, claims 1-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Haruki *et al.* (U.S. Patent No. 5,223,921; hereinafter referred to as "Haruki") in view of Yamada (U.S. Patent No. 6,573,935; hereinafter referred to as "Yamada") in view of Van Rooy *et al.* (U.S. Patent No. 6,657,659; hereinafter referred to as "Van Rooy") in view of Smith *et al.* (U.S. Patent No. 6,366,318; hereinafter referred to as "Smith").

In the Background section of the Specification, it was disclosed that "since the photosensors for pixels in the CCD are different in sensitivity from each other, there will exist a difference in amplitude between a G signal from a G pixel included in a horizontal line of R, G, R, G, ..., R and G color filters and a G signal from a G pixel included in a horizontal line of G, B, G, B, ..., G and B color filters. Therefore, in a single-chip color imaging apparatus, when a luminance signal is produced from color signals from pixels in each horizontal line, the above difference in sensitivity from one photosensor to the other will cause a difference in amplitude between luminance signals from the pixels in different horizontal lines and it will appear as a horizontal stripe-like noise in a monitoring image and captured image." *Background of the Specification, page 2, line 13 – page 3, line 1.*

Thus, the above paragraph of the Background highlights the problem associated with

difference in sensitivity from one photosensor to another that will cause a difference in amplitude

between luminance signals from the pixels in different horizontal lines.

To solve this problem, embodiments of the present invention provide a color imaging

apparatus including a gain controlling means for controlling the amplitude difference between

the luminance signals. For example, the structure of apparatus claim 1, as presented herein,

includes:

> "*a solid-state image sensor* having photosensors color-coded with three primary color filters formed like a matrix correspondingly to pixels of the solid-state image sensor, to provide three primary color signals acquired as captured image signals;

> *a four-channel signal detecting means* for detecting, from the three primary color signals provided from the solid-state image sensor, an R signal acquired from R pixels in a horizontal line of R, G, R, G, ..., R and G color filters, a Gr signal acquired from the G pixels in the same horizontal line, a Gb signal acquired from G pixels in a horizontal line of G, B, G, B, ..., G and B color filters, and a B signal acquired from the B pixels in the same horizontal line;

> *a four-channel variable-gain amplifying means* whose channels are controllable in gain independently of one another to amplify the R, Gr, Gb and B signals,

> *wherein* said R, Gr, Gb and B signals are amplified to substantially the same levels as one another, and *wherein* both luminance and chrominance signals are generated using the amplified four signals; and

> *a gain controlling means* for controlling, based on an output from the signal detecting means, the gains of R and B channels of the variable-gain amplifying means so that the R and B signals amplified by the variable-gain amplifying means are equal in level for an achromatic color image, and said gain controlling means generating a mean value of the outputs of Gr and Gb channels of the variable-gain amplifying means so that the amplitude difference between the luminance signal for the horizontal line of R, G, R, G, ..., R and G color filters produced from the R and Gr signal and the luminance signal for the horizontal line of G, B, G, B, ..., G and B color filters produced from the B and Gb signal is substantially reduced."

(emphasis added)

In summary, the color imaging apparatus of claim 1 includes a four-channel variable-gain

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amplifying means whose channels are controllable in gain independently of one another to amplify the R, Gr, Gb and B signals; *wherein said R, Gr, Gb and B signals are amplified to substantially the same levels as one another, and wherein both luminance and chrominance signals are generated using the amplified four signals;* and a gain controlling means for controlling the gains of R and B channels of the variable-gain amplifying means, and for generating a mean value of the outputs of Gr and Gb channels of the variable-gain amplifying means (see Mean Calculator 154A in Figure 4) so that the amplitude difference between the luminance signal produced from the R and Gr signal and the luminance signal produced from the B and Gb signal is substantially reduced.

It is submitted that Haruki, Yamada, Van Rooy and Smith, individually or in combination, do not disclose or teach "a four-channel variable-gain amplifying means whose channels are controllable in gain independently of one another to amplify the R, Gr, Gb and B signals; *wherein said R, Gr, Gb and B signals are amplified to substantially the same levels as one another, and wherein both luminance and chrominance signals are generated using the amplified four signals,*" as described in claim 1.

Therefore, it is maintained that Haruki, Yamada, Van Rooy and Smith, individually or in combination, fail to specifically teach or suggest the broader limitations of color imaging apparatus claim 1, including a four-channel variable-gain amplifying means whose channels are controllable in gain independently of one another to amplify the R, Gr, Gb and B signals; *wherein said R, Gr, Gb and B signals are amplified to substantially the same levels as one another, and wherein both luminance and chrominance signals are generated using the amplified four signals;* and a gain controlling means for controlling the gains of R and B channels of the variable-gain amplifying means, and for generating a mean value of the outputs

of Gr and Gb channels of the variable-gain amplifying means so that the amplitude difference between the luminance signal produced from the R and Gr signal and the luminance signal produced from the B and Gb signal is substantially reduced.

Based on the foregoing discussion, it is maintained that claim 1 should be allowable over the combination of Haruki, Yamada, Van Rooy, and Smith. Since independent claim 6 closely parallels, and includes substantially similar limitations as, independent claim 1, claim 6 should also be allowable over the combination of Haruki, Yamada, Van Rooy and Smith. Further, since claims 2-5 and 7-10 depend from claims 1 and 6, respectively, claims 2-5 and 7-10 should also be allowable over the combination of Haruki, Yamada, Van Rooy and Smith.

Accordingly, it is submitted that the rejection of claims 1-10 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

Conclusion

In view of the foregoing, entry of this amendment, and the allowance of this application with claims 1-10 are respectfully solicited.

In regard to the claims amended herein and throughout the prosecution of this application, it is submitted that these claims, as originally presented, are patentably distinct over the prior art of record, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes that have been made to these claims were not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes were made simply for clarification and to round out the scope of protection to which Applicant is entitled.
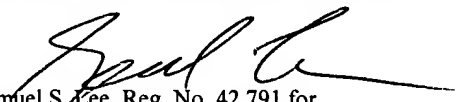
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In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicant's representative at the telephone number written below.

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account 50-0320.

Respectfully submitted,

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